INSULATING OIL, ELECTRICAL NAPHTHENIC

1. **Scope** This specification is for new inhibited naphthenic mineral oil refined for use as an insulating and cooling medium in oil-immersed transformers, oil switches, oil circuit breakers and related equipment. The oil shall be furnished in accordance with the latest revision of ASTM D-3487 Type II oil.

2. **Chemical and Physical Properties** The chemical and physical properties shall be as specified in Table 1, when tested in accordance with the applicable test procedures specified in Section 3.

3. **Supplier's Responsibility for Sampling, Inspection, and Tests**
   - 3.1 Sampling for purposes of inspection and test shall be in accordance with ASTM D-117, latest revision. A composite sample of not less than 5 gallons of oil shall be taken from each lot.
   - 3.2 Lot. For purposes of sampling, a lot shall consist of a manufacturer's batch. If the material cannot be identified by batch, a lot shall consist of not more than 10,000 gallons of oil of the same grade offered for delivery at one time.
   - 3.3 Inspection and Tests, as listed in Table 1, shall be conducted in accordance with the applicable ASTM test method.
   - 3.4 Test Reports. The supplier shall ensure that all inspection and tests required by this specification are performed on each batch of electrical insulating oil furnished.
     - 3.4.1 All inspection and tests shall be the responsibility of the supplier and shall be performed at his expense in a recognized laboratory. These test reports shall be certified by an authorized representative of the laboratory conducting the tests.
     - 3.4.2 A certified test report shall accompany the packing list.

4. **Packaging** Unless otherwise specified in the purchase order, oil will be shipped in tanker lots.

5. **Receiving Sampling** Upon receipt at the City of Seattle warehouse, the purchaser will test the oil for dielectric strength in accordance with the requirements of Table 1, and may further inspect or test for any or all of the requirements of Table 1.

6. **Rejection and Replacement**
   - 6.1 Oil may be rejected for failure to meet specified values as listed in Table 1.
   - 6.2 The supplier shall replace with an equal amount of oil any oil rejected under this specification.

ORIGINATOR	STANDARDS COORDINATOR	STANDARDS SUPERVISOR	UNIT DIRECTOR
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INSULATING OIL – ELECTRICAL
NAPHTHENIC

Stock No.: 753100

Table 1

Oil Characteristics

General: Insulating oil is refined mineral oil obtained from fractional distillation of crude petroleum. It shall not contain moisture, inorganic acids, alkalies, free sulfur, or any other substances that will injuriously affect its electrical insulating properties.

Oil shall contain 0.15% to 0.30% D.B.P.C.[1] inhibitor. Reaction	Neutral
Neutralization number: (mg. KOH per g. oil) (ASTM D-974)	0.03 max.
Free or combined corrosive sulfur (ASTM D-1275)	Non-corrosive
Flash point (ASTM D-92)	145º C (293º F) min.
Pour point (ASTM D-97)	-40º C (-40º F) min.
Viscosity (ASTM D-88 or D-445, 37.8º C, [100º F])	60.5 sec. max.
(ASTM D-88 or D-445 0º C [32º F])	320 sec. max.
Moisture Content (ASTM 1533)	35 ppm max.
Specific Gravity (ASTM D-1298) at 15.5º C (60º F)	0.91 (26.07 API) max.
Interfacial tension (ASTM D-971) dynes/cm	40 min.
Power Factor 60 cycle 25º C (77º F) (ASTM D-924)	0.05% max.
Dielectric Strength (ASTM D-877)	30 kV min.
* Dielectric Constant	2.2
* Precipitation number	zero
* Specific Heat	4.88 approx.
* Coefficient of expansion at 0º C (32º F)	0.000725
100º C (212º F)	0.000755
* Weight per gallon	7.5 lbs.
Color (ASTM D-1500)	.5 max.
Oxidation Life (ASTM D-943)	1000 min. hr.
PCB	Less than 1 ppm.

* Included for reference information; testing not required.

[1] Ditertiary-Butyl-Para-Cresol